

CP Chemistry Test Review – Ionic Bonding

Please refer to chapter 5 of your textbook in preparation for your test. Be familiar with all of the definitions and the questions you answered in your reading. Below is a comprehensive review of some of the materials that you will see on your test.

Writing formulas

You should be able to write the formula for simple, intermediate binary ionic compounds as well as ionic compounds containing a polyatomic ion. For practice, write the formula which corresponds to the name of the following ionic compounds.

1.) Simple binary formulas

$+1$ -1 sodium chloride	NaCl
$+1$ -1 lithium fluoride	LiF
$+2$ -2 magnesium oxide	MgO
$+2$ -1 Calcium chloride	CaCl ₂
$+1$ -2 Potassium oxide	K ₂ O

2.) Intermediate formulas

$+2$ -2 iron (II) oxide	FeO
$+3$ -2 manganese (III) sulfide	Mn ₂ S ₃
$+3$ -3 chromium (III) phosphide	Cr ₃ P ₂
$+4$ -1 lead (IV) bromide	PbBr ₄
$+1$ -2 copper (I) oxide	Cu ₂ O

3.) Polyatomic formulas

⁺¹ potassium	⁻¹ cyanide	KCN
⁺¹ ammonium	⁻¹ chloride	NH ₄ Cl
⁺² copper (II)	⁻² sulfate	CuSO ₄
⁺¹ lithium	⁻¹ bicarbonate	LiHCO ₃
⁺¹ hydrogen	⁻² peroxide	H ₂ O ₂

4.) Practice quiz

calcium	bromide	CaBr
titanium (IV)	oxide	TiO ₂
potassium	perchlorate	KClO ₄
sodium	phosphate	Na ₃ PO ₄
aluminum	hydroxide	Al(OH) ₃

Naming Ionic Compounds

You should be able to write the formula for simple, intermediate binary ionic compounds as well as ionic compounds containing a polyatomic ion. For practice, write the formula which corresponds to the name of the following ionic compounds.

5.) Simple binary ionic compounds

KI	Potassium Iodide
BeO	Beryllium oxide
CaBr ₂	Calcium Bromide
K ₂ O	Potassium oxide
MgCl ₂	Magnesium chloride

6.) Intermediate ionic compounds

FeCl ₃	Iron (III) chloride
CuO	Copper (II) oxide
Pb₂Cl	
HgCl ₂	Mercury (II) chloride
Cr ₂ O ₃	Chromium (III) oxide

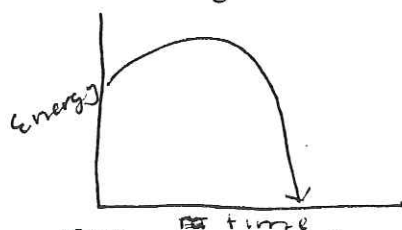
7.) Polyatomic ionic compounds

Ca(OH)_2	calcium hydroxide
NH_4Cl	ammonium chloride
$\text{Mn}_2(\text{SO}_3)_3$	manganese (III) sulfate
Al(CN)_3	aluminum cyanide
NaSCN	sodium thiocyanate

8.) Practice quiz

KCl	Potassium chloride
SnSe_2	Tin (IV) selenide
TiBr_3	Titanium (III) Bromide
$\text{Be(HCO}_3)_2$	Beryllium Bicarbonate
$\text{Cr(PO}_4)_2$	Chromium (VI) phosphate

9.) Alkali Metals Lab: In this lab we demonstrated the reactivity of the alkali metals and alkali earth metals with water. As you recall, sodium had a very strong reaction to the water. Did this reaction require energy? Did it give off energy? Draw a diagram indicating the flow of energy in this reaction.



At first it requires some energy to turn the solid Na to a gaseous Na and remove its electron, but once it reacts with water it releases energy. It is exothermic.

10.) Since we are mostly made of water, explain why we are able to consume sodium in our foods?

We aren't eating pure sodium, but rather sodium that may be combined with other elements

example NaCl (Table salt)

11.) How does an ionic bond form? Using an electron configuration or orbit diagram, give me an example of how ionic compounds are formed.

Na
[Ne] 3s

[Ne] 1
3s

the cation (Na)
donates an electron /
electrons to the
anion (Cl).

Opposite charges attract.

Sodium has a + charge now
Chlorine has a - charge.

Cl

[Ne] 3s² 3p⁵
[Ne] 1 1 1 1
3s 3p_x

12.) Complete the attached diagram.

p171 How much energy is required to go from Step 2 to step 3? Is this reaction exothermic or endothermic?

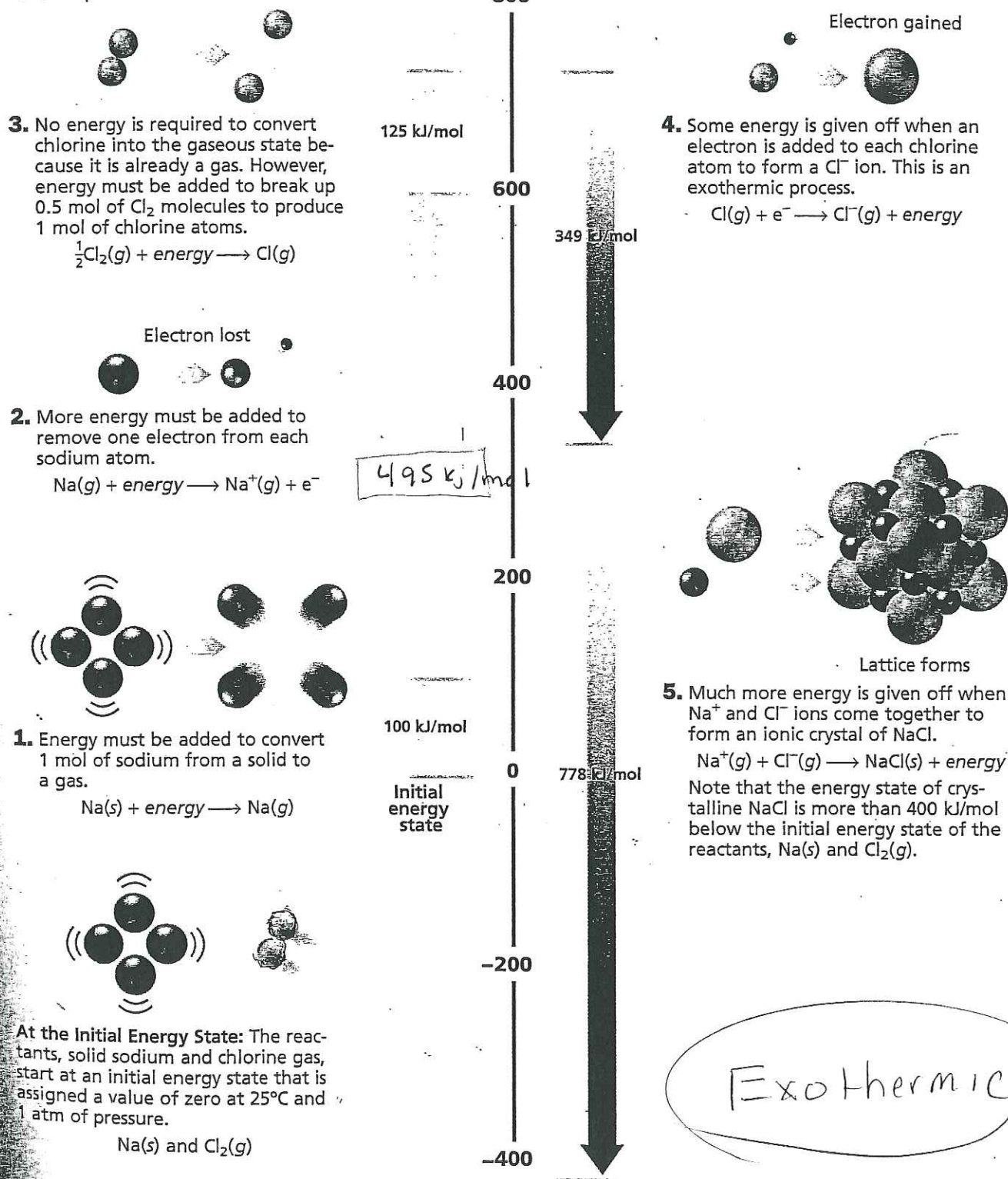


FIGURE 5-9

The reaction between $\text{Na}(s)$ and $\text{Cl}_2(g)$ to form sodium chloride can be broken down into steps. More energy is released during the exothermic steps than is absorbed during the endothermic steps, so the overall reaction is exothermic.